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10/732,910	12/09/2003	Younan Xia	53433/2	6911

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EXAMINER	
WYSZOMIERSKI, GEORGE P	
ART UNIT	PAPER NUMBER
1793	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/732,910	XIA ET AL.	
	Examiner	Art Unit	
	George P. Wyszomierski	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 November 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-53* is/are pending in the application.

4a) Of the above claim(s) *1-3 and 15-46* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *4-14 and 47-53* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. The Amendment filed November 21, 2007 has been entered. Claims 1-53 are pending, with claims 1-3 and 15-46 withdrawn from consideration as directed to a non-elected invention.

2. Claim 52 is objected to because in line 2 of this claim, the word "ration" is clearly meant to read --ratio--. Correction is required.

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 47, 51 and 52 are rejected under 35 U.S.C. 102(b) as being anticipated by the Sun et al. June 5, 2002 Advanced Materials article (Sun A) or the Sun et al. Chem. Mater. article (Sun C).

These two articles disclose making silver nanowires having an aspect ratio as recited in claim 52 by obtaining solutions of silver nitrate and of PVP in a solvent, and combining the solutions at a molar ratio as recited in claim 47 under reaction conditions such that a silver nanowire is formed. With respect to claim 51, the prior art teaches that silver nanowires are produced and therefore the examiner' position is that the silver nitrate concentration, PVP concentration, reaction temperature and growth time in the prior art are within the limits of lines 5-7 of this claim. Thus, all aspects of the claimed invnetion are held to be fully disclosed by Sun A or Sun C.

5. Claims 51 and 52 are rejected under 35 U.S.C. 102(b) as being anticipated by the Sun et al. Nano Letters article (Sun N).

The Sun N article discloses making silver nanowires having an aspect ratio as recited in claim 52 by obtaining solutions of silver nitrate and of PVP in a solvent, and combining the solutions under reaction conditions such that a silver nanowire is formed. Because the result of this process is that silver nanowires are produced, the examiner' position is that the silver nitrate concentration, PVP concentration, reaction temperature and growth time in the prior art are within the limits of lines 5-7 of claim 51. Thus, all aspects of the claimed invention are held to be fully disclosed by Sun N.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 48-50 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sun A or Sun C.

The Sun A and C articles, discussed supra, do not specify the precise parameters of the process as recited in claims 48-50 or that the nanowires have a pentagonal cross section as recited in claim 53. However,

a) With regard to claims 48-50, differences in parameters such as concentrations or temperatures will not generally support patentability of subject matter encompassed by the prior art unless there is evidence indicating such a parameter is critical. Where the general

conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation; see *In re Aller* (105 USPQ 233, CCPA 1955).

b) With regard to claim 53, the actual chemical process steps conducted in the prior art appears to be the same or nearly so as those of the present invention. It is thus a reasonable assumption that the resulting material would likewise be the same in both instances.

Thus, a prima facie case of obviousness is established between the disclosure of the Sun A article or the Sun C article and the presently claimed invention.

8. Claims 47-50 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sun N, in view of either Sun A or Sun C.

The Sun N article, discussed in item no. 5 supra, does not specify some of the parameters as recited in instant claims 47-50 or the pentagonal cross section of instant claim 53. However, the Sun A and Sun C articles indicate that it is known to perform the Sun N process under at least some of the conditions as presently claimed. Any deviation from these conditions would appear to be a matter of routine experimentation and thus would not render the claimed invention patentable for reasons as stated in item 7(a) supra. Also, such a process would likely result in a product having the characterisitics as set forth in claim 53, for reasons as stated in item 7(b) supra.

Thus, the combined disclosure of Sun N with that of Sun A or Sun C would have led one of ordinary skill in the art to the process as presently claimed.

9. Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sun A or Sun C.

Sun A and Sun C disclose mixing silver nitrate ad PVP solutions in ethylene glycol, with the concentration of silver nitrate and the ratio of PVP to silver nitrate being in the range recited in claim 12. The molecular weight of the PVP in the prior art is 55,000. The mixtures are reacted at 160.deg.C for 60 minutes in Sun A, and for a variety of time periods in Sun C.

The prior art does not teach the forming of nanocubes, as required by the instant claims. However, the prior art processes appear to be substantially identical to those as claimed, i.e. performed using identical materials under identical conditions. What appears to occur in the prior art (see Figures 2 and 3 of Sun A or Figure 2B of Sun C) is that some cubic shaped materials form in this process, and some of these materials may then grow into wires or other shapes that are not nanocubes. However, it would appear that nanocubes are formed in the prior art, at least initially. Thus, no patentable distinction is seen between the process as claimed and that as disclosed in either Sun A or Sun C.

10. Claims 4-14 and 47-53 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-31 and 33-39 of copending Application No. 11/701974. Although the conflicting claims are not identical, they are not patentably distinct from each other because while the particular ranges recited in the various claims of the instant application and the '974 application differ, the '974 claims recite a variety of concentration and temperature ranges suitable for the production of various nanoscale silver materials, including the nanopyramids, nanocubes, and nanowires that result from the processes as presently claimed. Because the process defined in the instant claims and that of the '974 claims appear to involve the same set of steps, performed in the same order, and in both cases with

various parameters of those steps controlled or adjusted to preferentially form a particular shaped final object, no patentable distinction is seen between the claimed process and that of the '974 application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

11. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

12. In a response filed November 21, 2007, Applicant alleges that the Sun articles used in the claim rejections supra should not be applied against the instant claims because these articles were published during a one-year grace period prior to the filing of a provisional application, in which 35 USC 102(b) does not apply. Applicant is correct only to the extent that the claims are fully supported under the first paragraph of 35 USC

112 in the provisional application; see MPEP 706.02 (VI)(D). The examiner's position is that none of the instant claims are fully supported in the provisional application.

a) With respect to claims 4-11, nothing in the provisional application discloses the use of any solvent other than ethylene glycol, and the provisional application contains no disclosure whatsoever of the subject matter of claims 5-10 and 12.

b) With respect to claims 12-14, the provisional application contains no disclosure of the temperature range of 155-175.deg.C, and contains no disclosure of the subject matter of claim 13.

c) With respect to claims 47-53, the provisional application contains no disclosure whatsoever of the forming of nanowires.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Wyszomierski whose telephone number is (571) 272-1252. The examiner can normally be reached on Monday thru Friday from 8:00 a.m. to 4:30 p.m. Eastern time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached on (571) 272-1244. All patent application related correspondence transmitted by facsimile must be directed to the central facsimile number, (571)-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

GEORGE WYSZOMIERSKI
PRIMARY EXAMINER
GROUP 1700

GPW
February 1, 2008